

Date: Tuesday, 3/20/2007 1:51:54 PM  
 User: Kim Johnston

## Process Sheet

|                       |   |                  |                 |
|-----------------------|---|------------------|-----------------|
| Customer              | : CU-DAR001 Dart Helicopters Services               | Drawing Name     | : AFT CROSSTUBE |
| Job Number            | : 31371   |                  |                 |
| Estimate Number       | : 10377   |                  |                 |
| P.O. Number           | : N/A   | Part Number      | : D2890         |
| This Issue            | : 3/20/2007 S.O. No. : N/A                          | Drawing Number   | : D2890 REV B   |
| Prsht Rev.            | : NC  | Project Number   | : N/A           |
| First Issue           | : N/A Type : PURCHASED PARTS                        | Drawing Revision | : B             |
| Previous Run          | : 31370   | Material         | : N/A           |
| Written By            | : <u>JA 07.03.20</u>                                | Due Date         | : 4/10/2007     |
| Checked & Approved By | : <u>JA 07.03.20</u>                                | Qty:             | 1 Um: Each      |
| Comment               | : Est. B 05.03.21 Removed Bending procedures KJ/JLM |                  |                 |

## Additional Product

Job Number:



|         |                       |               |
|---------|-----------------------|---------------|
| Seq. #: | Machine Or Operation: | Description : |
|---------|-----------------------|---------------|

|     |          |                     |
|-----|----------|---------------------|
| 1.0 | D6008180 | Crosstube extrusion |
|-----|----------|---------------------|



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

Pick:

|     |           |                     |       |
|-----|-----------|---------------------|-------|
| Qty | Part #    | Description         | Batch |
| 1   | D6008-180 | Crosstube extrusion | 25667 |

EL 7-5-14

|     |         |                 |
|-----|---------|-----------------|
| 2.0 | BENDING | BENDING MACHINE |
|-----|---------|-----------------|



Comment: BENDING MACHINE

1-Bend D2890 as per Dwg D2890 and Folio FT002

EL 7-5-14

|     |     |                   |
|-----|-----|-------------------|
| 3.0 | QC6 | DIMENSIONAL CHECK |
|-----|-----|-------------------|



Comment: DIMENSIONAL CHECK

JA 06.19 ①

|     |                |                         |
|-----|----------------|-------------------------|
| 4.0 | LANDING GEAR 1 | LANDING GEAR RESOURCE 1 |
|-----|----------------|-------------------------|



Comment: LANDING GEAR RESOURCE 1

1-Deburr and Polish

N/A

|     |                |                            |
|-----|----------------|----------------------------|
| 5.0 | HAND FINISHING | HAND FINISHING RESOURCE #1 |
|-----|----------------|----------------------------|



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes ☐ No ☒ DQA: RD Date: 07/06/20  
 QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                             |                                 |                |                           |                       |                          |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng        | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |
|      |      |                                  |                             |                                 |                |                           |                       |                          |

NOTE: Date & initial all entries

Date: Tuesday, 3/20/2007 1:51:55 PM  
User: Kim Johnston

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: AFT CROSSTUBE

Job Number: 31371

Part Number: D2890

Job Number:



Seq. #:

Machine Or Operation:

Description :

6.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



N/A



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

7.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock

Location: W/O 31375

2 07-06-19 (1)

8.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

107/06/20 (1)

Job Completion



C 207/06/20

| W/O: |      | WORK ORDER CHANGES |    |      |     |                                     |                          |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE   | By | Date | Qty | Approval<br>Chief Eng /<br>Prod Mgr | Approval<br>QC Inspector |
|      |      |                    |    |      |     |                                     |                          |
|      |      |                    |    |      |     |                                     |                          |

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

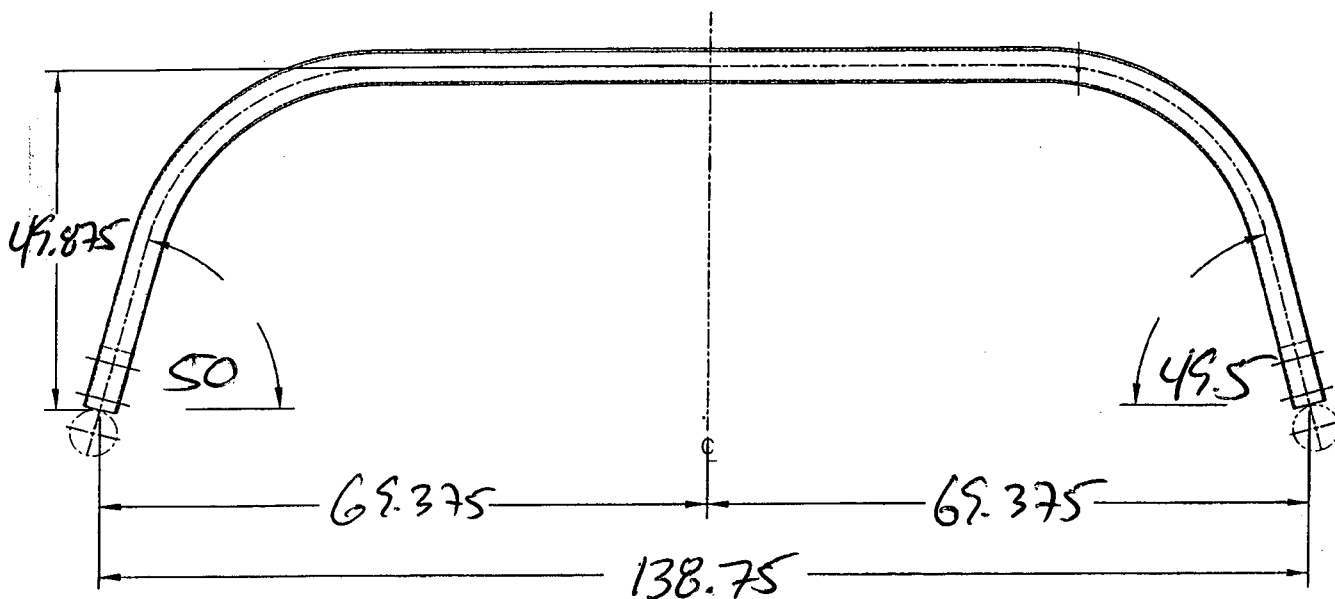
QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

| NCR: |      | WORK ORDER NON-CONFORMANCE (NCR) |                                |                                 |                |                           |                       |                          |
|------|------|----------------------------------|--------------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC<br>Section A   | Corrective Action<br>Section B |                                 |                | Verification<br>Section C | Approval<br>Chief Eng | Approval<br>QC Inspector |
|      |      |                                  | Initial<br>Chief Eng           | Action Description<br>Chief Eng | Sign &<br>Date |                           |                       |                          |
|      |      |                                  |                                |                                 |                |                           |                       |                          |
|      |      |                                  |                                |                                 |                |                           |                       |                          |
|      |      |                                  |                                |                                 |                |                           |                       |                          |

**NOTE:** Date & initial all entries

|                            |  |              |             |
|----------------------------|--|--------------|-------------|
| DART AEROSPACE LTD         |  | Work Order:  | 31371       |
| Description: Crosstube Aft |  | Part Number: | D2890       |
| Inspection Dwg: D2890      |  | Rev: B       | Page 1 of 1 |

| Required Dimension | Min    | Max    |
|--------------------|--------|--------|
| Height             | 49.875 | 50.125 |
| 1/2 Span           | 69.275 | 69.525 |
| Angle              | 49     | 52     |
| Total Span         | 138.55 | 139.05 |



| Comments                      |
|-------------------------------|
| Tube is used for -103 B 31375 |
|                               |
|                               |
|                               |

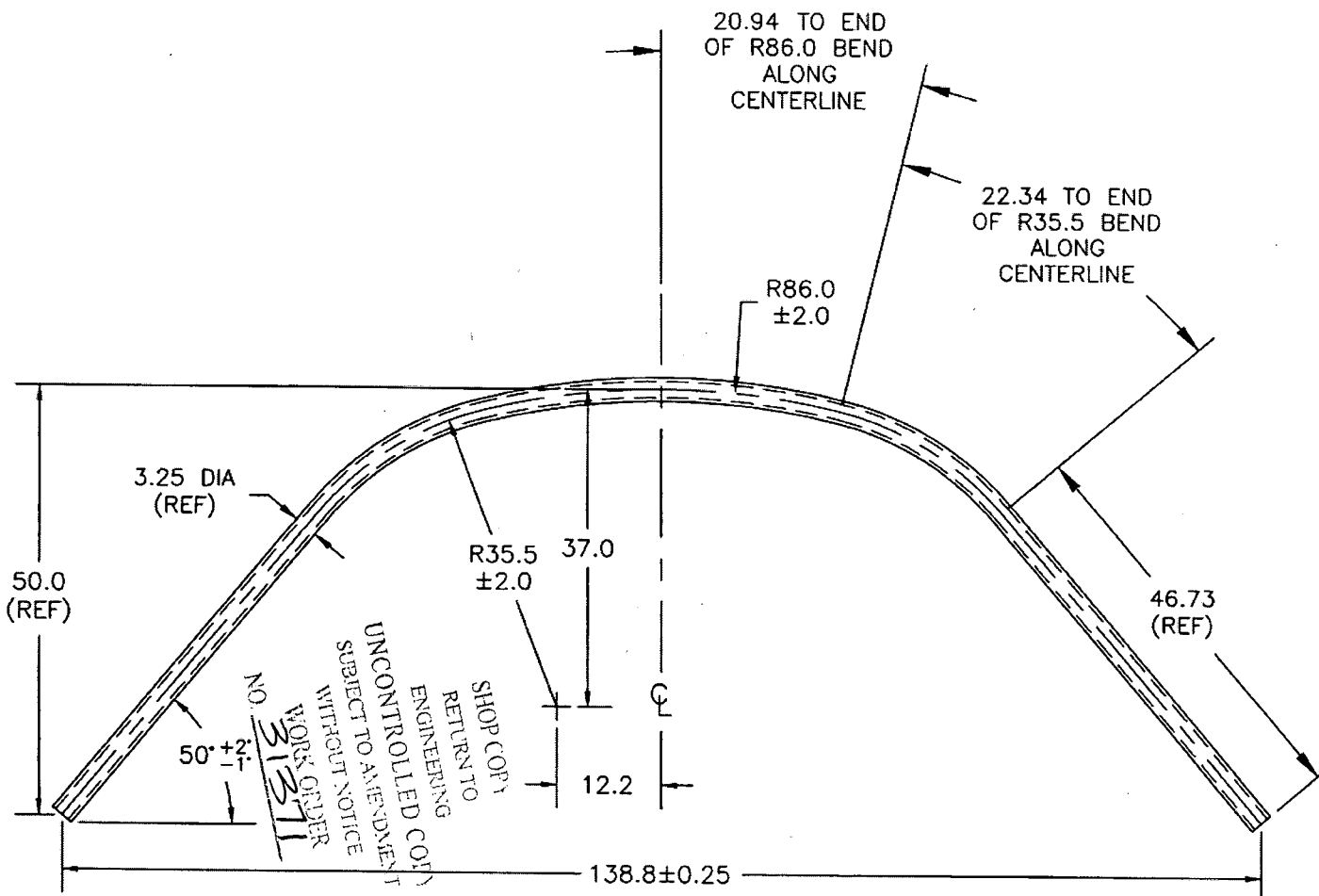
|                 |          |
|-----------------|----------|
| QC15 Inspection | CWO/J    |
| Date            |          |
|                 | 07-06-19 |

| Rev | Date     | Change    | Revised by | Approved |
|-----|----------|-----------|------------|----------|
| A   | 07.02.06 | New Issue | KJ/JM      |          |



RELEASED  
02.10.28

| DESIGN           | DRAWN BY | DART AEROSPACE LTD<br>HAMKESBURY, ONTARIO, CANADA |               |
|------------------|----------|---|---------------|
| CHECKED          | APPROVED | DRAWING NO.<br>D2890                              | REV. B        |
| DATE<br>02.10.18 |          | TITLE<br>AFT CROSSTUBE                            | SHEET 1 OF 1  |
| A                | 99.05.21 | NEW ISSUE   | SCALE<br>1:20 |
| B                | 02.10.18 | ADD TANGENT LENGTHS; CHANGE NOTES                 |               |



#### NOTES

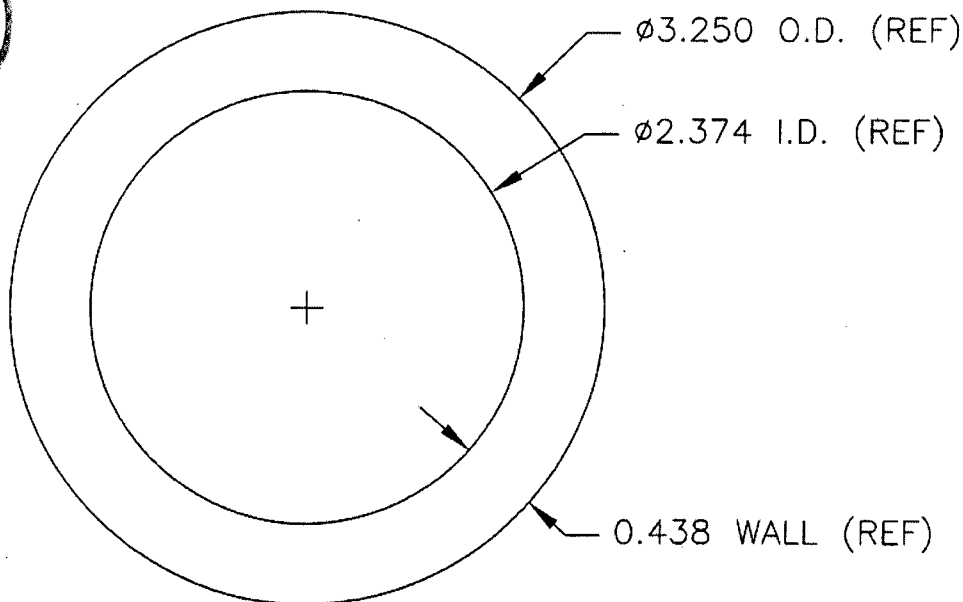
- 1) MATERIAL: MANUFACTURE FROM D6008-180 ( $\phi$ 3.25 OD x 0.438 WALL)
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
- 3) PART IS SYMMETRIC ABOUT CENTERLINE
- 4) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 5) BEND PROGRESSIVELY WITH MINIMUM OF 3 PASSES
- 6) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.



|                     |                       |   |                        |
|---------------------|-----------------------|---|------------------------|
| DESIGN<br><i>CP</i> | DRAWN BY<br><i>CP</i> | DART AEROSPACE LTD<br>HAWKESBURY, ONTARIO, CANADA |                        |
| CHECKED<br><i>#</i> | APPROVED<br><i>#</i>  | DRAWING NO.<br>D6008                              | REV. A<br>SHEET 1 OF 1 |
| DATE<br>00.11.17    |                       | TITLE<br>CROSSTUBE MATERIAL                       | SCALE<br>1:1           |
| A                   | 00.11.17              | NEW ISSUE   |                        |

## SPECIFICATION CONTROL DRAWING

RELEASED  
00.11.24 *#*



### NOTES

- 1) D6008-XXX CROSSTUBE  
LENGTH

WHERE XXX IS LENGTH IN INCHES  
EG. 180" LONG TUBE: D6008-180

- 2) MATERIAL: 3.250 OD x 0.438 WALL 7075-T6/T6511 (WW-T-700/7 OR QQ-A-225/9 OR QQ-A-200/11) SEAMLESS ALUMINUM TUBE.  
MINIMUM ULTIMATE TENSILE STRENGTH = 77 ksi  
MINIMUM YIELD TENSILE STRENGTH = 66 ksi
- 3) TOLERANCES ARE PER ASTM B210 AS FOLLOWS:  
O.D.:  $\pm 0.008$  MEAN ( $\pm 0.016$  INCLUDING OVALITY)  
WALL:  $\pm 0.020$  MEAN ( $\pm 0.044$  INCLUDING ECCENTRICITY)  
LENGTH: XXX  $+0.125/-0.000$   
STRAIGHTNESS: 0.010" DEVIATION / 12" LENGTH
- 4) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 5) CHEMICAL CONVERSION COAT PER DART QSI 005 4.1

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